

Having described the invention, what is claimed is:

1           1. A thrust bearing with needle rollers, the thrust bearing comprising:

2           a first race component made of a first material and including a flat, circular raceway

3           portion, defined about an axis, and an axially extending lip portion;

4           a plurality of needle rollers arranged radially with respect to the axis for rolling

5           contact with the flat raceway portion of the first race component;

6           a bearing cage retaining the needle rollers and engageable with the lip portion of the

7           first component for piloting of the bearing cage; and

8           a second race component made of a second material and including a flat portion in

9           contact with the raceway portion of the first race component and, also, including a lip

10          portion extending axially and radially from the flat portion and beyond the lip portion of the

11          first race component such that the second race component is engageable by the bearing cage

12          to hold the first race component, the second race component and the bearing cage together

13          as an assembly.

1           2. A thrust bearing according to claim 1, wherein the axially extending lip portion

2           of the first race component is radially outward of the raceway portion of the first race

3           component.

1           3. A thrust bearing according to claim 1, wherein the axially extending lip portion

2           of the first race component is radially inward of the raceway portion of the first race

3           component.

1           4. A thrust bearing according to claim 1, further comprising an additional thrust  
2 race including a circular raceway portion for rolling contact with the rollers, the rollers being  
3 positioned between the circular raceway portions of the first race component and the  
4 additional thrust race.

1           5. A thrust bearing according to claim 4, wherein the additional thrust race  
2 comprises two components made of different materials.

1           6. A thrust bearing according to claim 4, wherein the additional thrust race is  
2 engageable by the bearing cage to retain the additional thrust race and the bearing cage  
3 together as an assembly.

1           7. A thrust bearing according to claim 1, wherein the first race component is made  
2 of bearing quality steel and the second race component is made of a more ductile material.

1           8. A thrust bearing according to claim 1, wherein the first race component is made  
2 of bearing quality steel and the second race component is made of a more easily welded  
3 material.

1           9. A thrust bearing according to claim 1, wherein the first race component is made  
2 of a high carbon steel and the second race component is made of a lower carbon steel.

10. A thrust bearing according to claim 1, wherein the second race component is staked, at a plurality of locations along a circumference of the lip portion of the second race component, over the lip of the first race component, such that the first race component, the second race component and the bearing cage are retained together as an assembly.

11. A thrust bearing according to claim 1, wherein the second race component includes an extension portion extending axially from the flat portion of the second race component and in a direction away from the rollers.

12. A thrust bearing according to claim 1, wherein the first and second race components are formed from sheet metal, the first and second materials being different from each other.

13. A method of making a thrust bearing, the method comprising:  
cutting a first component blank from sheet metal;  
providing a second component blank made from sheet metal of a different material;  
positioning the first component blank against the second component blank;  
bending the first component blank and the second component blank together such that the first component blank forms a first race component including a flat, circular raceway portion, defined about an axis, and an axially extending lip portion, and such that the second component blank forms a second race component including a flat portion in contact with the raceway portion of the first race component and a lip portion extending axially from the flat portion and beyond the lip portion of the first race component.

1           14. A method of making a thrust bearing according to claim 13, further comprising  
2 positioning a bearing cage with needle rollers against the raceway portion of the first  
3 component and forming of the axially extending lip portion of the second race component  
4 such that the lip portion is engageable by the bearing cage to retain the first race component,  
5 the second race component and the bearing cage together as an assembly.

1           15. A method of making a thrust bearing according to claim 13, further comprising  
2 forming an extension portion of the second race component extending axially from the flat  
3 portion of the second race component and in a direction away from the rollers.

1           16. A method of making a thrust bearing according to claim 13, further comprising  
2 bonding the first component blank to the second component blank.

1           17. A method of making a thrust bearing, the method comprising:  
2 cutting a first component blank from sheet metal;  
3 providing a second component blank made from sheet metal of a different material;  
4 positioning the first component blank against the second component blank;  
5 bending the first and second component blanks separately, and subsequently  
6 assembling the first and second component blanks together, such that the first component  
7 blank forms a first race component including a flat, circular raceway portion, defined about  
8 an axis, and an axially extending lip portion, and such that the second component blank  
9 forms a second race component including a flat portion in contact with the raceway portion

10 of the first race component and a lip portion extending axially from the flat portion and  
11 beyond the lip portion of the first race component.

1 18. A method of making a thrust bearing according to claim 17, further comprising  
2 positioning a bearing cage with needle rollers against the raceway portion of the first  
3 component and forming of the axially extending lip portion of the second race component  
4 such that the lip portion is engageable by the bearing cage to retain the first race component,  
5 the second race component and the bearing cage together as an assembly.

1 19. A method of making a thrust bearing according to claim 17, further comprising  
2 forming an extension portion of the second race component extending axially from the flat  
3 portion of the second race component and in a direction away from the rollers.

1 20. A method of making a thrust bearing according to claim 17, further comprising  
2 bonding the first component blank to the second component blank.